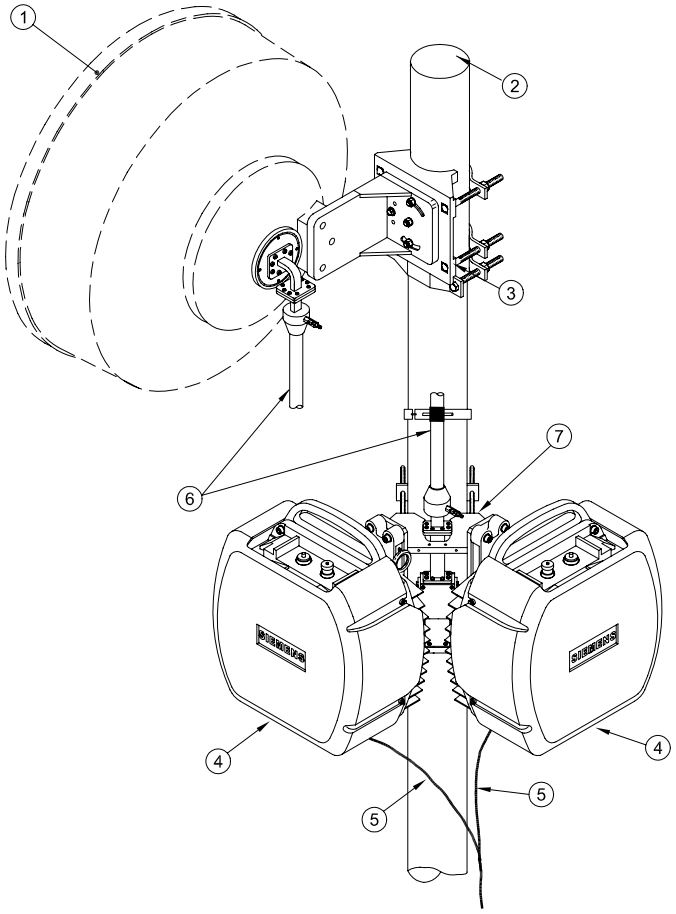
### 3.2.7.2 1+1 system HSBY

**Fig. 3.28 Connections (1+1 Hot Standby system)**

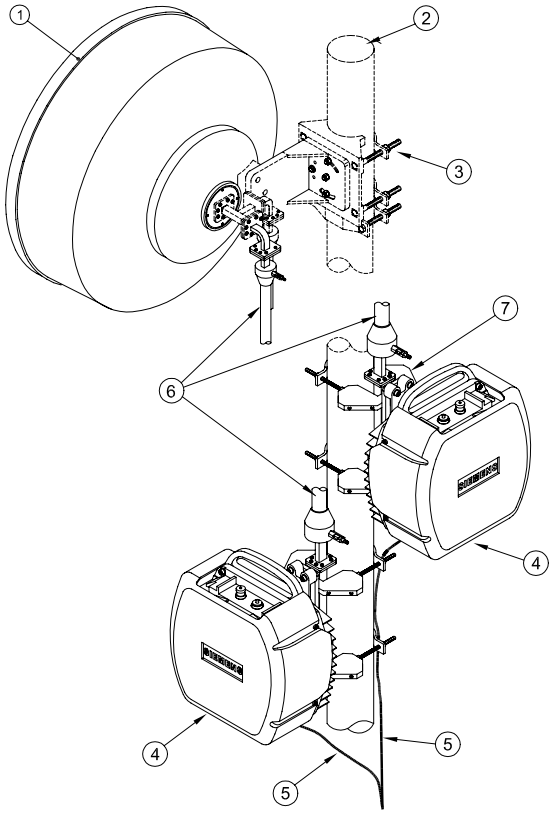
1 - Antenna
2 - Pole diam 115 mm
3 - Antenna support
4 - ODU
5 - 1/4 “ coaxial cable (IF cable)
6 - Elliptical waveguide
7 - ODU frame



### 3.2.7.3 2+0 system

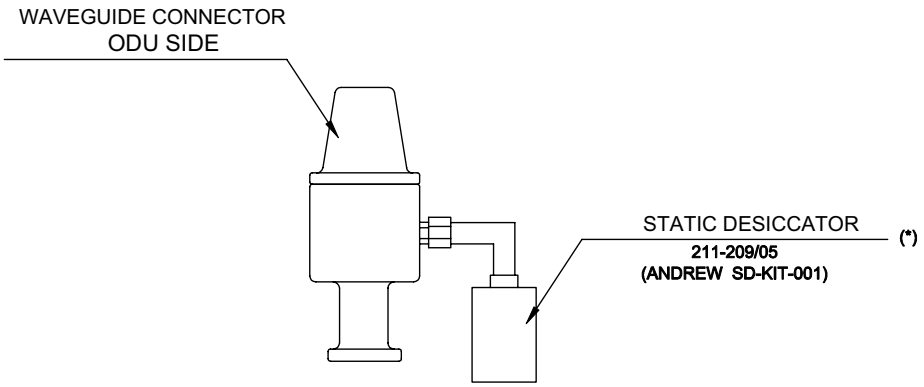
**Fig. 3.29 Connections (2+0 system)**

1 - Antenna
2 - Pole diam 115 mm
3 - Antenna support
4 - ODU
5 - 1/4 “ coaxial cable (IF cable)
6 - Elliptical waveguide
7 - ODU frame



### 3.2.7.4 Static desiccator for small system

**Fig. 3.30 Static desiccator for small system**

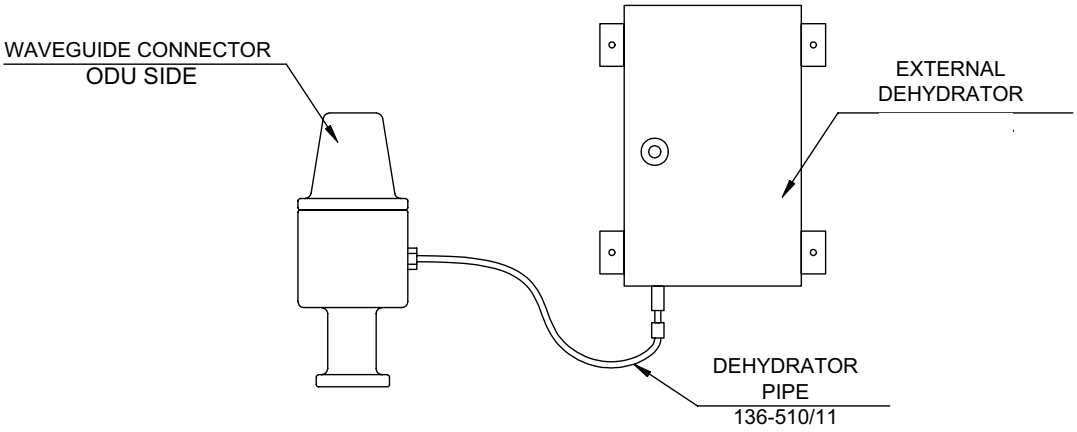



IT IS RECOMMENDED FOR SMALL AND SHORT WAVEGUIDE RUN UP TO:
5 m (7 GHz) AND 6 m (8 GHz)

* = TYPICAL SERVICE LIFE IS ONE YEAR.

### 3.2.7.5 Pressurization with external dehydrator

**Fig. 3.31 Pressurization with external dehydrator**




IT IS RECOMMENDED FOR WAVEGUIDE RUN OVER:
5 m (7 GHz) AND 6 m (8 GHz)

Before inserting the static desiccator, it it recommended to clear the waveguide using nitrogen or dry air with a double quantity respect to the volume of the installed waveguide.

### 3.2.7.6 P/N and composition

**ODU 6 GHz**

**Tab. 3.7 Elliptical waveguide (31263-XXX): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1a | Elliptical waveguide (6L) | | |
| 1b | Elliptical waveguide (6U) | | |
| 2 | Adapter for angular (10 pcs) | | |
| 3a | Waveguide clamp (10 pcs) | | |
| 3b | Waveguide clamp (10 pcs) | | |

**Tab. 3.8 Connectors and accessories (31263-778SR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| a1 | Waveguide connector (6L)(PDR 70) | | |
| a2 | Waveguide connector (6U) (PDR 70) | | |
| b | Pressurization window (UDR-UDR 70) | | |
| d | Waveguide support | | |
| e | Universal clamp (diam. 62) | | |
| f1 | Rubber bush (diam. 62) | | |
| f2 | Rubber bush (diam. 62) | | |
| A | 90° P.E. bend (UDR-UDR 70) | | |
| B | Right section (PDR-PDR 70) | | |
| C | Twist (UDR-PDR 70) | | |
| E | Adapter (UDR70-UDR70) | | |

**ODU 7 GHz**

**Tab. 3.9 Elliptical waveguide (31263-750): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1a | Elliptical waveguide (EWP 64-71) | 127-042/05 | note 1-3 |
| 1b | Elliptical waveguide (EWP 77-71W) | 127-042/14 | note 1-4 |
| 2 | Adapter for angular (10 pcs) | 165-005/84 | note 1 |
| 3a | Waveguide clamp (10 pcs) | 165-005/69 | note 1-3 |
| 3b | Waveguide clamp (10 pcs) | 165-005/70 | note 1-4 |

**Tab. 3.10 Connectors and accessories (31263-778SR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| a1 | Waveguide connector EWP 64-71 (PDR 84) | 504-237/99 | 2<br>note 3 |
| a2 | Waveguide connector EWP 77-71W (PDR 84) | 504-237/87 | 2<br>note 4 |
| b | Pressurization window (UDR-UDR 84) | 308-005/16 | 1 |
| d | Waveguide support | 332-055/21 | 3 |
| e | Universal clamp (diam. 62) | 165-005/19 | 3 |
| f1 | Rubber bush (diam. 62) | 332-202/90 | 3<br>note 3 |
| f2 | Rubber bush (diam. 62) | 332-202/87 | 3<br>note 4 |
| A | 90° P.E. bend (UDR-UDR 84) | 504-393/36 | 1<br>note 5 |
| B | Right section (PDR-PDR 84) | 504-816/27 | 1 |
| C | Twist (UDR-PDR 84) | 504-631/21 | 1<br>note 2 |
| E | Adapter (UDR70-UDR84) | 504-216/21 | 1<br>note 6 |

Note 1 - Quantity to be defined as per plant requirements.

Note 2 - Optional, use for horizontal polarization only.

Note 3 - For channelling 7.1-7.4 GHz (shifter 161 MHz) and 7.4-7.7 GHz (shifter 154, 161, 168 MHz).

Note 4 - For channelling 7.4-7.9 GHz (shifter 245 MHz).

Note 5 - Do not supply with antennas ø ≥ 1.8 m.

Note 6 - Supply with antennas ø ≥ 1.8 m.

**ODU 8 GHz**

**Tab. 3.11 Elliptical waveguide (31263-758): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1 | Elliptical waveguide (EWP 77-77) | 127-042/06 | note 1 |
| 2 | Adapter for angular (10 pcs) | 165-005/84 | note 1 |
| 3 | Waveguide clamp (10 pcs) | 165-005/70 | note 1 |

**Tab. 3.12 Connectors and accessories (31263-779SR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| a | Waveguide connector (PDR 84) | 504-237/87 | 2 |
| b | Pressurization window (UDR-UDR 84) | 308-005/16 | 1 |
| d | Waveguide support | 332-055/21 | 3 |
| e | Universal clamp (diam. 62) | 165-005/19 | 3 |
| f | Rubber bush (diam. 62) | 332-202/87 | 3 |
| A | 90° P.E. bend (UDR-UDR 84) | 504-393/36 | 1 |
| B | Right section (PDR-PDR 84) | 504-816/27 | 1 |
| C | Twist (UDR-PDR 84) | 504-631/21 | 1<br>note 2 |

Note 1 - Quantity to be defined as per plant requirements.

Note 2 - Optional, use for horizontal polarization only.

**ODU 10 GHz**

**Tab. 3.13 Elliptical waveguide (31263-YYY): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1 | Elliptical waveguide | | note 1 |
| 2 | Adapter for angular (10 pcs) | 165-005/84 | note 1 |
| 3 | Waveguide clamp (10 pcs) | 165-005/71 | note 1 |

**Tab. 3.14 Connectors and accessories (31263-YYYSR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| a | Waveguide connector (PDR 100) | | 2 |
| b | Pressurization window (UDR-UDR 100) | 308-005/34 | 1 |
| d | Waveguide support | 332-055/21 | 3 |
| e | Universal clamp (diam. 38) | 165-005/17 | 3 |
| f | Rubber bush (diam. 38) | 332-202/81 | 3 |
| A | 90° P.E. bend (UDR-UDR 100) | 504-418/52 | 1 (note 5) |
| B | Right section (PDR-PDR 100) | 504-816/33 | 1 |
| C | Twist (UDR-PDR 100) | 504-657/01 | 1 (note 2) |

Note 1 - Quantity to be defined as per plant requirements.

Note 2 - Optional, use for horizontal polarization only.

Note 3 - Do not supply with antennas ø ≥ 1.8 m.

**ODU 11 GHz**

**Tab. 3.15 Elliptical waveguide (31263-762): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1 | Elliptical waveguide (EWP 90-107) | 127-042/07 | note 1 |
| 2 | Adapter for angular (10 pcs) | 165-005/84 | note 1 |
| 3 | Waveguide clamp (10 pcs) | 165-005/71 | note 1 |

**Tab. 3.16 Connectors and accessories (31263-796SR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| a | Waveguide connector (PDR 100) | 504-237/88 | 2 |
| b | Pressurization window (UDR-UDR 100) | 308-005/34 | 1 |
| d | Waveguide support | 332-055/21 | 3 |
| e | Universal clamp (diam. 38) | 165-005/17 | 3 |
| f | Rubber bush (diam. 38) | 332-202/81 | 3 |
| A | 90° P.E. bend (UDR-UDR 100) | 504-418/52 | 1 (note 5) |
| B | Right section (PDR-PDR 100) | 504-816/33 | 1 |
| C | Twist (UDR-PDR 100) | 504-657/01 | 1 (note 2) |

Note 1 - Quantity to be defined as per plant requirements.

Note 2 - Optional, use for horizontal polarization only.

Note 3 - Do not supply with antennas ø ≥ 1.8 m.

**ODU 13 GHz**

**Tab. 3.17 Elliptical waveguide (31263-766): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| 1 | Elliptical waveguide (EWP 127) | 127-042/08 | note 1 |
| 2 | Adapter for angular (10 pcs) | 165-005/84 | note 1 |
| 3 | Waveguide clamp (10 pcs) | 165-005/72 | note 1 |

**Tab. 3.18 Connectors and accessories (31263-796SR): composition**

| ITEM | Description | P/N | Q.ty |
|---|---|---|---|
| f | Waveguide connector (PDR 120) | 504-237/89 | 2 |
| h | Pressurization window (UDR-UDR 120) | 308-005/35 | 1 |
| i | Waveguide support | 332-055/21 | 3 |
| l | Universal clamp (diam. 38) | 165-005/17 | 3 |
| n | Rubber bush (diam. 38) | 332-202/83 | 3 |
| p | 90° P.E. bend (UDR-UDR 120) | 504-418/53 | 1 (note 5) |
| q | Right section (PDR-PDR 120) | 504-816/34 | 1 |
| r | Twist (UDR-PDR 120) | 504-657/11 | 1 (note 2) |

Note 1 - Quantity to be defined as per plant requirements.

Note 2 - Optional, use for horizontal polarization only.

Note 3 - Do not supply with antennas ø ≥ 1.8 m.

# 3.3 INTERNAL CONNECTIONS

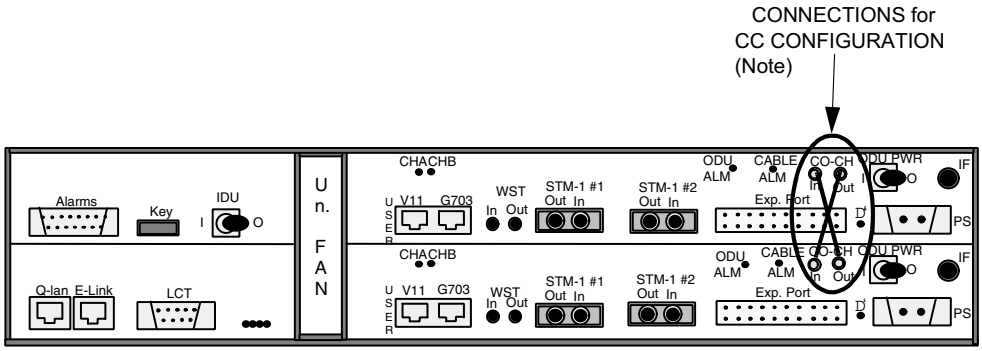
The internal connections are based on the equipment configuration and on the type of channelling implemented.

1. 2+0 CC configured equipment (par. 3.3.1):
   The internal connections must be made between the two ODU's and on the IDU.
2. N+1 configured equipment (par. 3.3.2):
   The internal connections must be made between the two IDU's.

## 3.3.1 2+0 CC Configuration

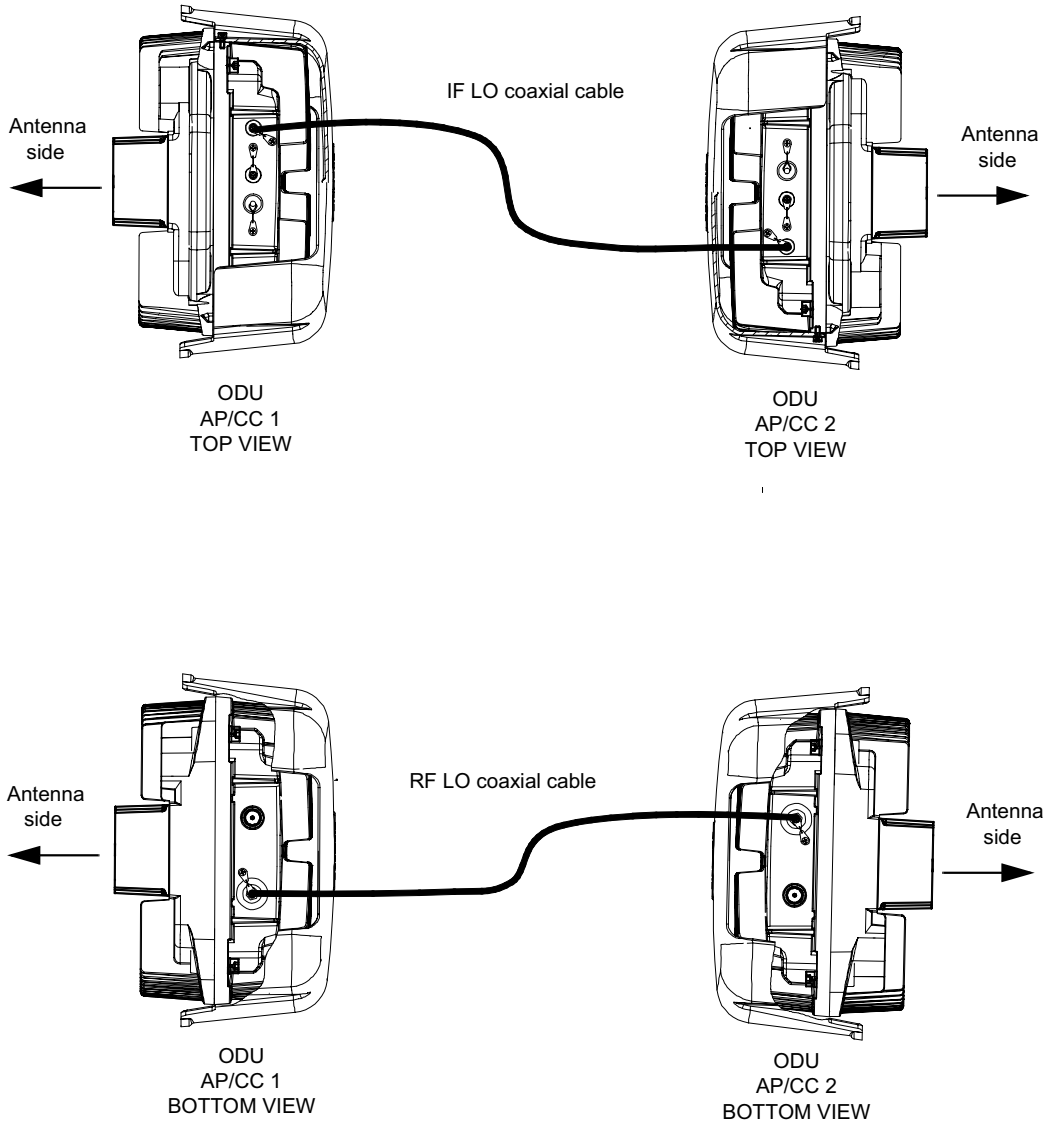
To set up the CC configuration coaxial cable connections must be implemented on the IDU assembly and on the ODU assemblies (see Fig. 3.32 and Fig. 3.33).

**Fig. 3.32 IDU assembly with connections in order to CC configure**




Note: These cables are included in the P/N 702-300/12.

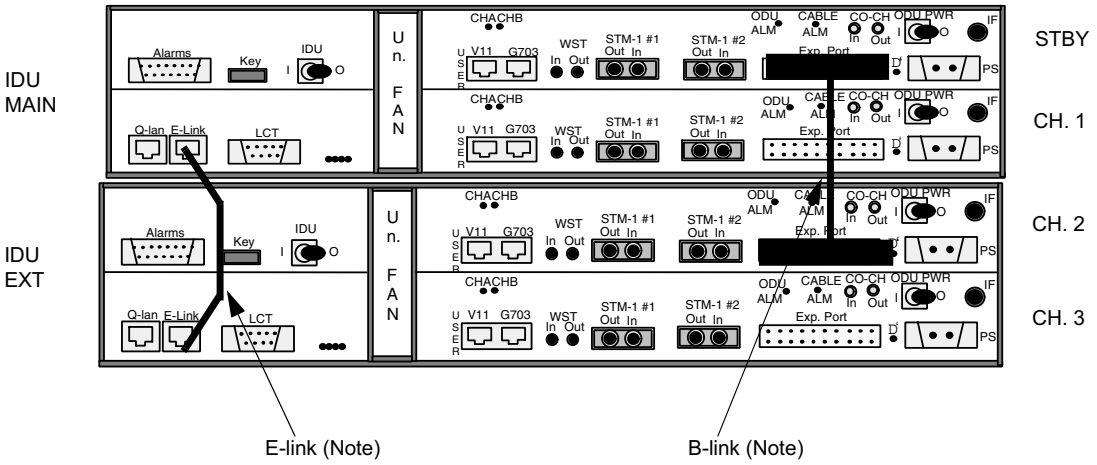
**Fig. 3.33 ODU AP/CC assemblies with connections in order to CC configure**



## 3.3.2 N+1 Configuration

The connections between the IDU assemblies shown in Fig. 3.34 must be made in order to set up the supervisory link (E-link) and the protection link (B-link).

**Fig. 3.34 Connection between the IDU assemblies (B-link and E-link)**




Note: These cables are included in the N+1 base connection elements (P/N 597-525/57).

# 3.4 EXTERNAL CONNECTIONS

All the connectors used for the external connections are easily accessible from the front side of the indoor assembly.

All the cables from/to the outside are brought down from the cabinet top inside the side wall slots or, in the case the wiring is running under the raised floor, they are made to ascend likewise.

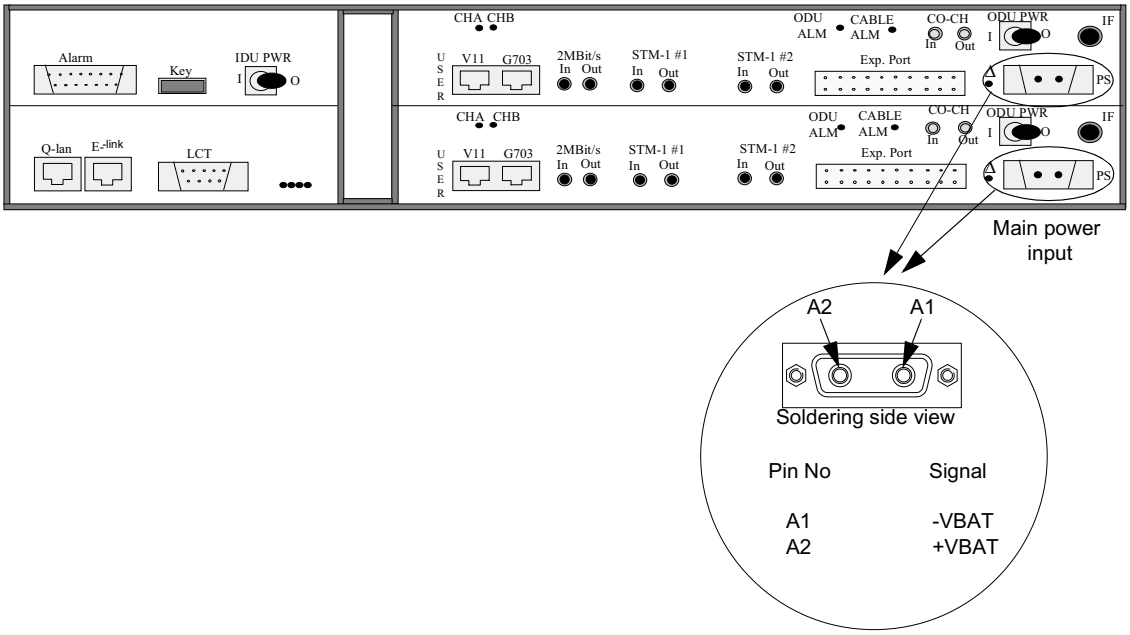
## 3.4.1 Primary supply voltage connection

The outdoor assembly (ODU) is remotely power supplied by the indoor assembly (P/N 702-300/12) by means of an IF coaxial connection cable (2 in the 1+1 configuration).

The indoor assembly BB units are fed by DC/DC converters, which transform the delivered -48 V voltage.

The primary supply voltage, delivered by 48 V battery, has to be applied to the 2-poles male connector MAIN POWER INPUT. See Fig. 3.35.

**Fig. 3.35 Primary Power Supply Connections**



## 3.4.2 Connector functions

Fig. 3.37 to Fig. 3.41 and Tab. 3.19 to Tab. 3.25, show the positions and functions of the connectors P/N 598-645/45.

**In the N+1 configuration the connectors with a cross in Fig. 3.36 are not used.**

**Fig. 3.36 Connectors not used in the N+1 configuration**

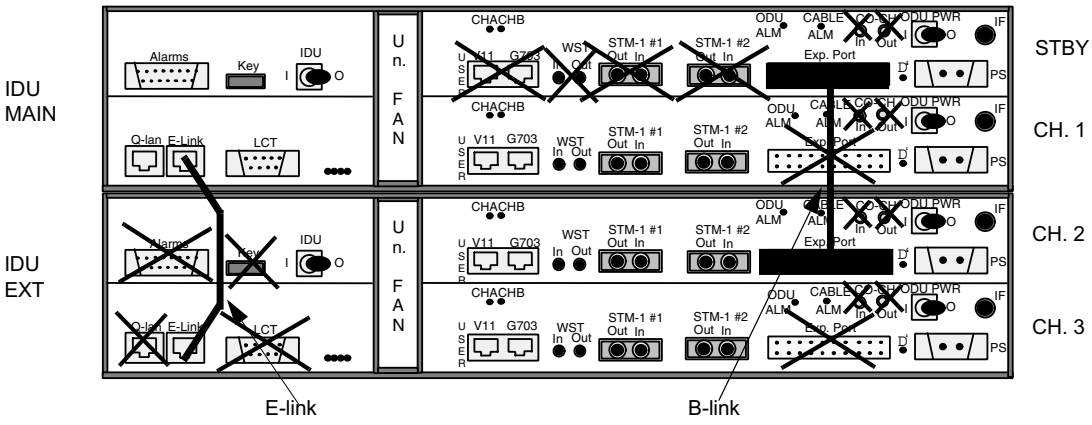
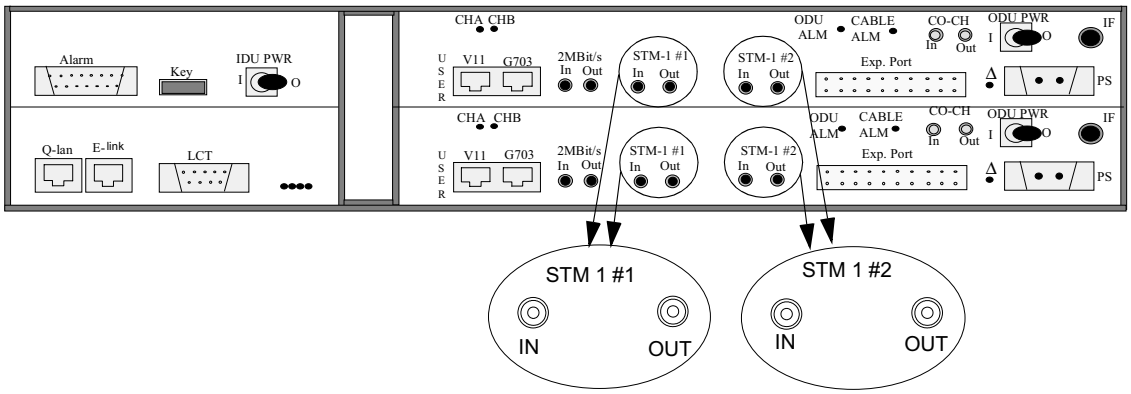
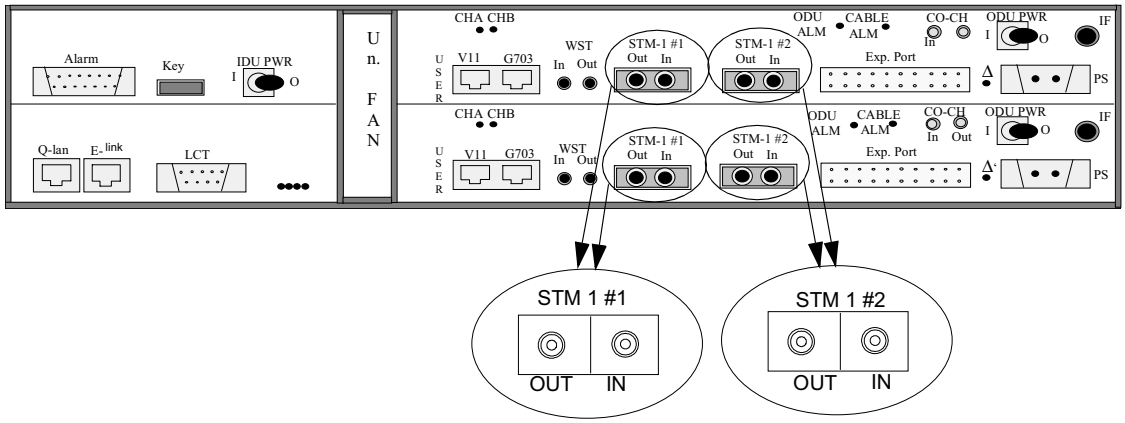


**Fig. 3.37 155 Mbit/s Tributary Coaxial Connections**

**Electrical interface**




**Optical interface**



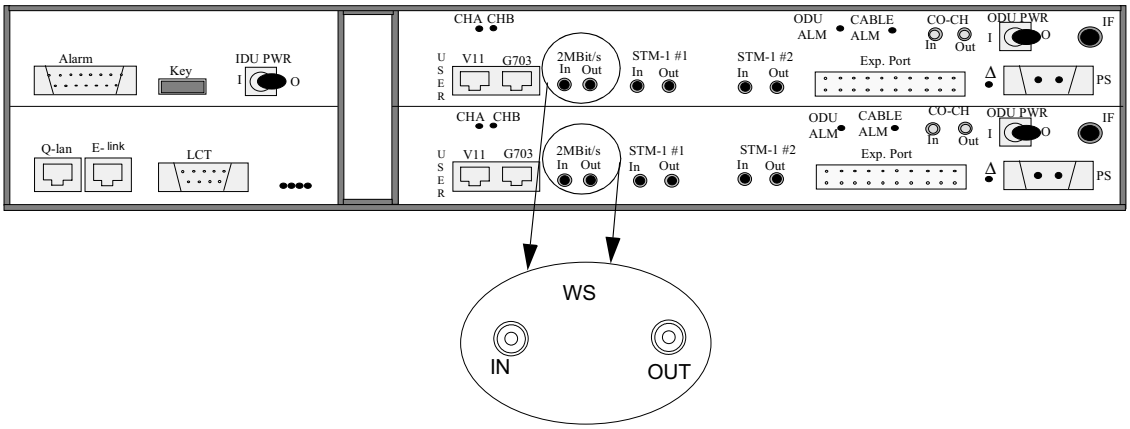

**Tab. 3.19 155 Mbit/s Electrical Tributary Coaxial Connections**

| Coax. | Signal |
|---|---|
| IN | 155 Mbit/s Tributary Input 75 Ohm (G.703) |
| OUT | 155 Mbit/s Tributary Output 75 Ohm (G.703) |

**Tab. 3.20 STM-1 Optical Tributary Connections**

| SC | Signal |
|---|---|
| IN | Optical Tributary Input |
| OUT | Optical Tributary Output |

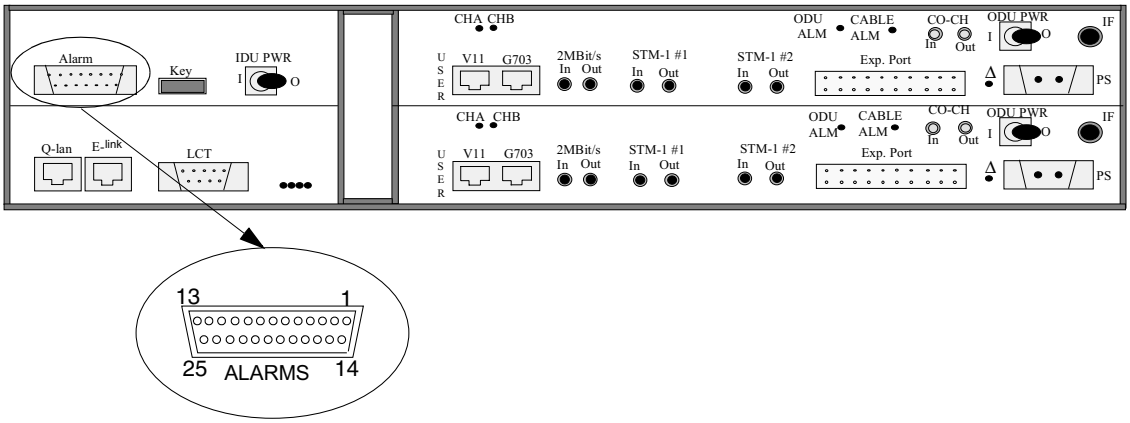
**Fig. 3.38 WST 2 Mbit/s Coaxial Connections**




**Tab. 3.21 WST 2 Mbit/s Coaxial Connections**

| Connect. Position | Description |
|---|---|
| IN | 2048 Mbit/s/75 Ohm (G.703) WS Input |
| OUT | 2048 Mbit/s/75 Ohm (G.703) WS Output |

**Fig. 3.39 Alarm Connector**



**Tab. 3.22 Alarms Connector (IDU assembly)**

| Pin | Signal | Description | Interface type |
|---|---|---|---|
| 1 | ALIM OFF | No secondary power supply on both BB-Modem units | B |
| 2 | CRITICAL | Critical alarm | B |
| 3 | MINOR | Minor alarm | B |
| 8 | MAJOR | Major alarm | B |
| 9 | TEST | Test/Warning alarm | B |
| 4 | CEN-OUT1 | Station alarm output #1 | B |
| 10 | CEN-OUT2 | Station alarm output #2 | B |
| 5 | CEN-OUT3 | Station alarm output #3 | B |
| 11 | CEN-OUT4 | Station alarm output #4 | B |
| 6 | CEN-IN1 | Station alarm input #1 | B |
| 12 | CEN-IN2 | Station alarm input #2 | B |
| 7 | CEN-IN3 | Station alarm input #3 | B |
| 13 | CEN-IN4 | Station alarm input #4 | B |
| 14 | RESTFAULT | | B |
| 15 | RESTFAULTN | | B |
| 16 | - | Not used | - |
| 17 | - | Not used | - |
| 18 | - | Not used | - |
| 19 | - | Not used | - |
| 20 | - | Not used | - |
| 21 | - | Not used | - |
| 22 | - | Not used | - |
| 23 | - | Not used | - |
| 24 | - | Not used | - |
| 25 | - | Not used | - |

Interface B = electronic contact normal condition = open (-3 ... +2 Vdc; > 60 kohm)
alarm condition = ground (-3 ... +2 Vdc; < 200 ohm)

**INPUT STATION ALARMS:**

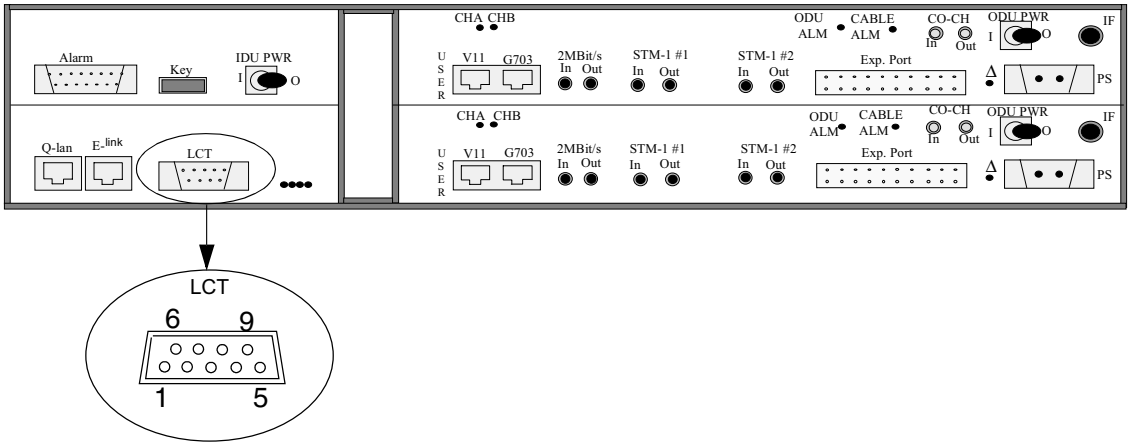
- **the input does not sink current as long as the input voltage is less than 5 V**
- **the circuit will not be damaged as long as the input voltage is between -70 V and 75 V.**

**OUTPUTS ALARMS:**

- **the external equipment (sensing the output alarms) can be positive voltage or negative voltage:**
  - **“open” resistance > 500 Mohm**
  - **“ground” resistance < 1 ohm**
  - **max. switching voltage: 110 Vdc**
  - **max. switching current: 0.5 A**
  - **max. switching power (resistive load): 15 W**

Note: Refer also to par. 2.2 – "TECHNICAL CHARACTERISTICS" for the electrical interface of the alarms.

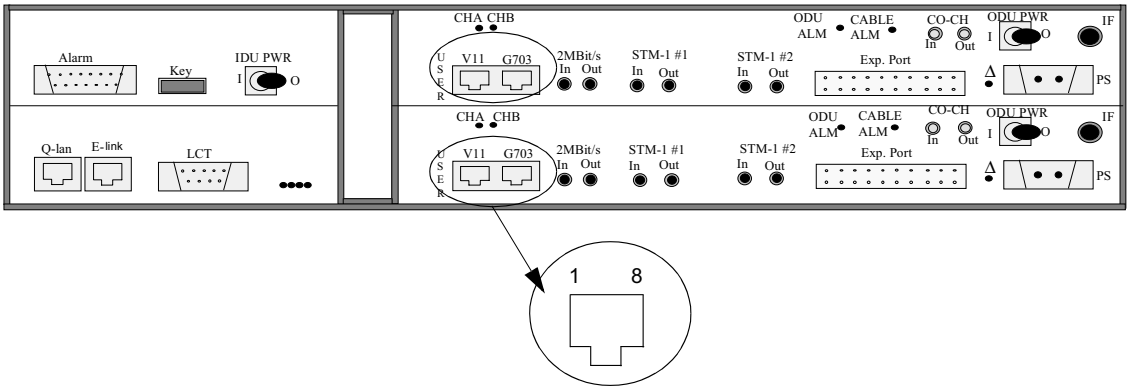
**Fig. 3.40 LCT (RS 232) Connector**




**Tab. 3.23 LCT (RS 232) Connector**

| PIN | Signal | I/O | Description |
|---|---|---|---|
| 1 | F_CD | I | Received Line Signal Detector (Data Carrier Detect) |
| 2 | F_RXD | I | Received Data |
| 3 | F_TXD | O | Transmit Data |
| 4 | F_DTR | O | Data Terminal Ready |
| 5 | GND | | Signal Ground |
| 6 | F_DSR | I | Data Set Ready |
| 7 | F_RTS | O | Request To Send |
| 8 | F_CTS | | Clear To Send |
| 9 | n.c. | | Ring Indicator |

**Fig. 3.41 64 kbit/s service channel connector**




**Tab. 3.24 V.11 channel connector**

| PIN | Signal | I/O | Description |
|---|---|---|---|
| 8 | CKB | O | Clock B - codirectional output |
| 7 | CKA | O | Clock A - codirectional output |
| 6 | DB | O | Data B - codirectional output |
| 5 | DA | O | Data A - codirectional output |
| 4 | CKB | O | Clock B - contradirectional output |
| 3 | CKA | O | Clock A - contradirectional output |
| 2 | DB | I | Data B - contradirectional input |
| 1 | DAa | I | Data A - contradirectional input |

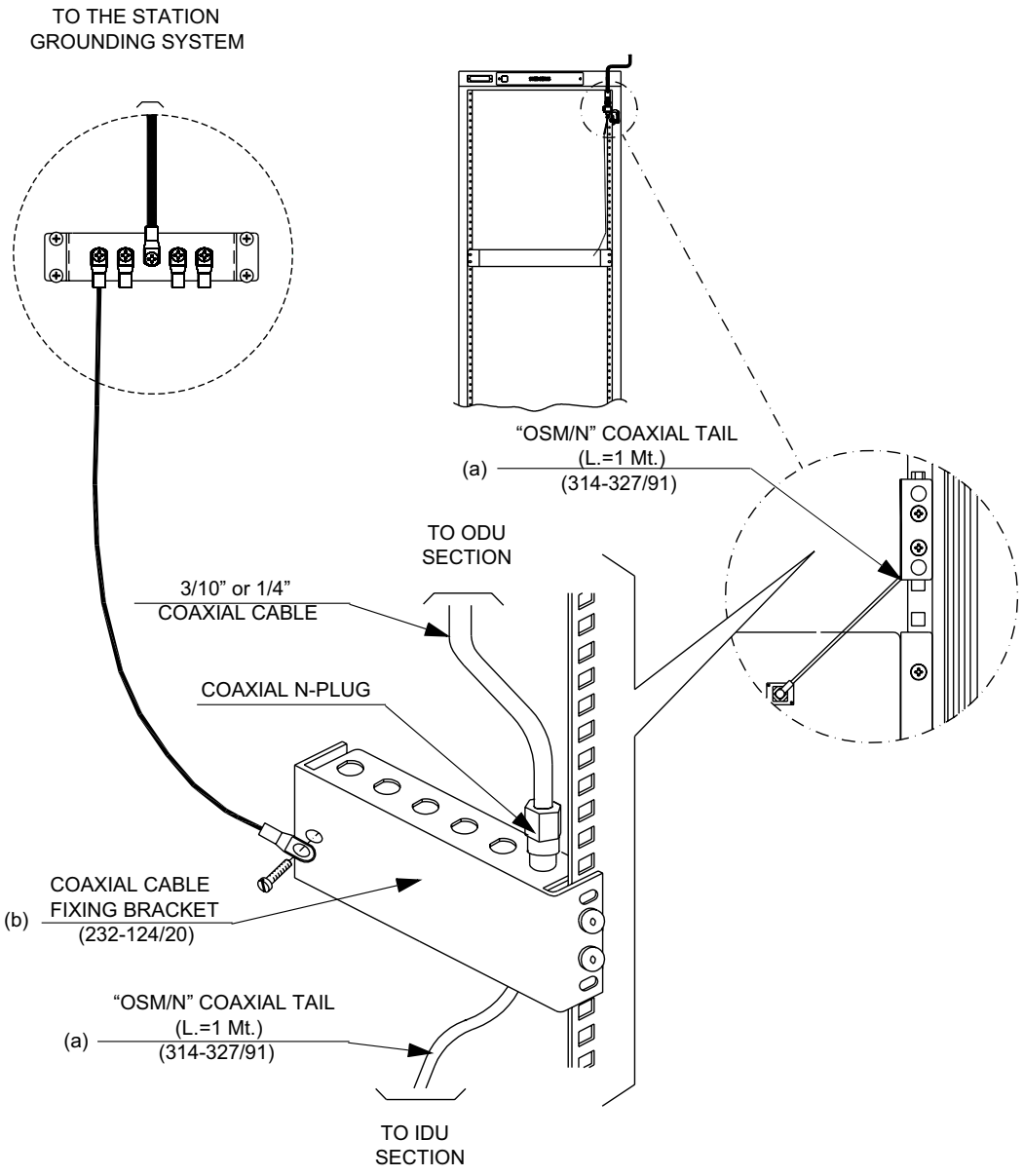
**Tab. 3.25 G.703 channel connector**

| PIN | Signal | I/O | Description |
|---|---|---|---|
| 1 | OUT - | O | Output - |
| 2 | OUT + | O | Output + |
| 3 | - | - | - |
| 4 | - | - | - |
| 5 | - | - | - |
| 6 | - | - | - |
| 7 | IN + | I | Input + |
| 8 | IN - | I | Input - |

### 3.4.3 IF connections

The indoor assembly is connected by one IF coaxial cable to the outdoor assembly (transceiver) (see Fig. 3.42).

**Fig. 3.42 IF connections between ODU and IDU**




(a) = This material is included in the base connection elements (1+0) 597-525/21, (1+1) 597-525/22 or (1+0>1+1) 597-525/33.

(b) = This material is included in the fixing accessories 332-011/35, included in the base connection element 597-525/21 and 597-525/22.

## 3.4.4 Base connection elements

In the following paragraph is given the information on the cables to be used during the installation.

### 3.4.4.1 Connection elements for 1+0 system (P/N 597-525/21)

Refer to Tab. 3.26.

**Tab. 3.26 Connection elements for 1+0 system (P/N 597-525/21)**

| Ref. Fig. 3.43 | P/N | Description | Q.ty |
|---|---|---|---|
| 6 | 332-308/64 | Power supply kit | 1 |
| 14 | 422-030/83 | Metal shell | 1 |
| 15 | 422-062/61 | Sub-D conn 25P | 1 |
| 16 | 422-053/63 | Modular plug 8P shielded | 4 |
| 26 | 421-015/70 | 1.0/2.3 coaxial plug | 6 |
| 30 | 314-302/70 | Earth cable | 1 |
| 32 | 206-701/06D | Hexagonal thin nuts M4 | 1 |
| 33 | 207-505/09D | Plain washer SST 4 PIC | 1 |
| 34 | 207-501/09D | Spring washer Inox 4 | 1 |
| 61 | 206-710/21 | Cage nut M6 | 4 |
| 62 | 205-534/11D | Screw 6x16 | 4 |
| 63 | 211-516/01 | Bush 6x3.5 | 4 |
| 65 | 332-309/76 | Mounting kit | 1 |
| 80 | 314-327/91 | (N-OSM) coaxial cable | 1 |
| 82 | 332-011/35 | IDU/ODU cable clampe kit | 1 |

### 3.4.4.2 Connection elements for 1+1/2+0 system (P/N 597-525/22)

Refer to Tab. 3.27.

**Tab. 3.27 Connection elements for 1+1/2+0 system (P/N 597-525/22)**

| Ref. Fig. 3.44 | P/N | Description | Q.ty |
|---|---|---|---|
| 6 | 332-308/64 | Power supply kit | 2 |
| 14 | 422-030/83 | Metal shell | 1 |
| 15 | 422-062/61 | Sub-D conn 25P | 1 |
| 16 | 422-053/63 | Modular plug 8P shielded | 6 |
| 26 | 421-015/70 | 1.0/2.3 coaxial plug | 12 |
| 30 | 314-302/70 | Earth cable | 1 |
| 32 | 206-701/06D | Hexagonal thin nuts M4 | 1 |
| 33 | 207-505/09D | Plain washer SST 4 PIC | 1 |
| 34 | 207-501/09D | Spring washer Inox 4 | 1 |
| 61 | 206-710/21 | Cage nut M6 | 4 |
| 62 | 205-534/11D | Screw 6x16 | 4 |
| 63 | 211-516/01 | Bush 6x3.5 | 4 |
| 65 | 332-309/76 | Mounting kit | 1 |
| 80 | 314-327/91 | (N-OSM) coaxial cable | 2 |
| 82 | 332-011/35 | IDU/ODU cable clampe kit | 1 |

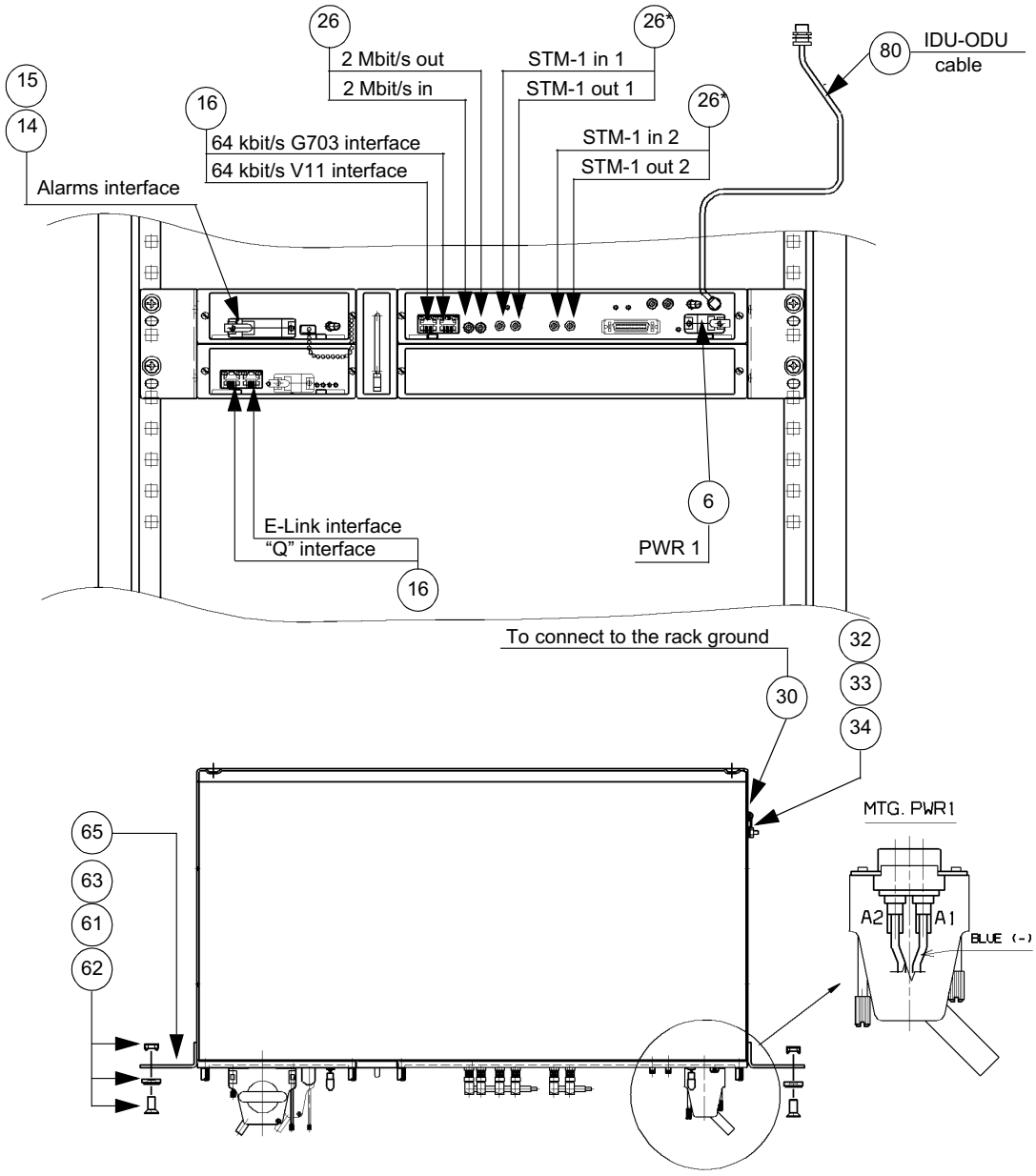
### 3.4.4.3 Connection elements for upgrading from 1+0 to 1+1/2+0 (P/N 597-525/33)

Refer to Tab. 3.28.

**Tab. 3.28 Connection elements for upgrading from 1+0 to 1+1/2+0 (P/N 597-525/33)**

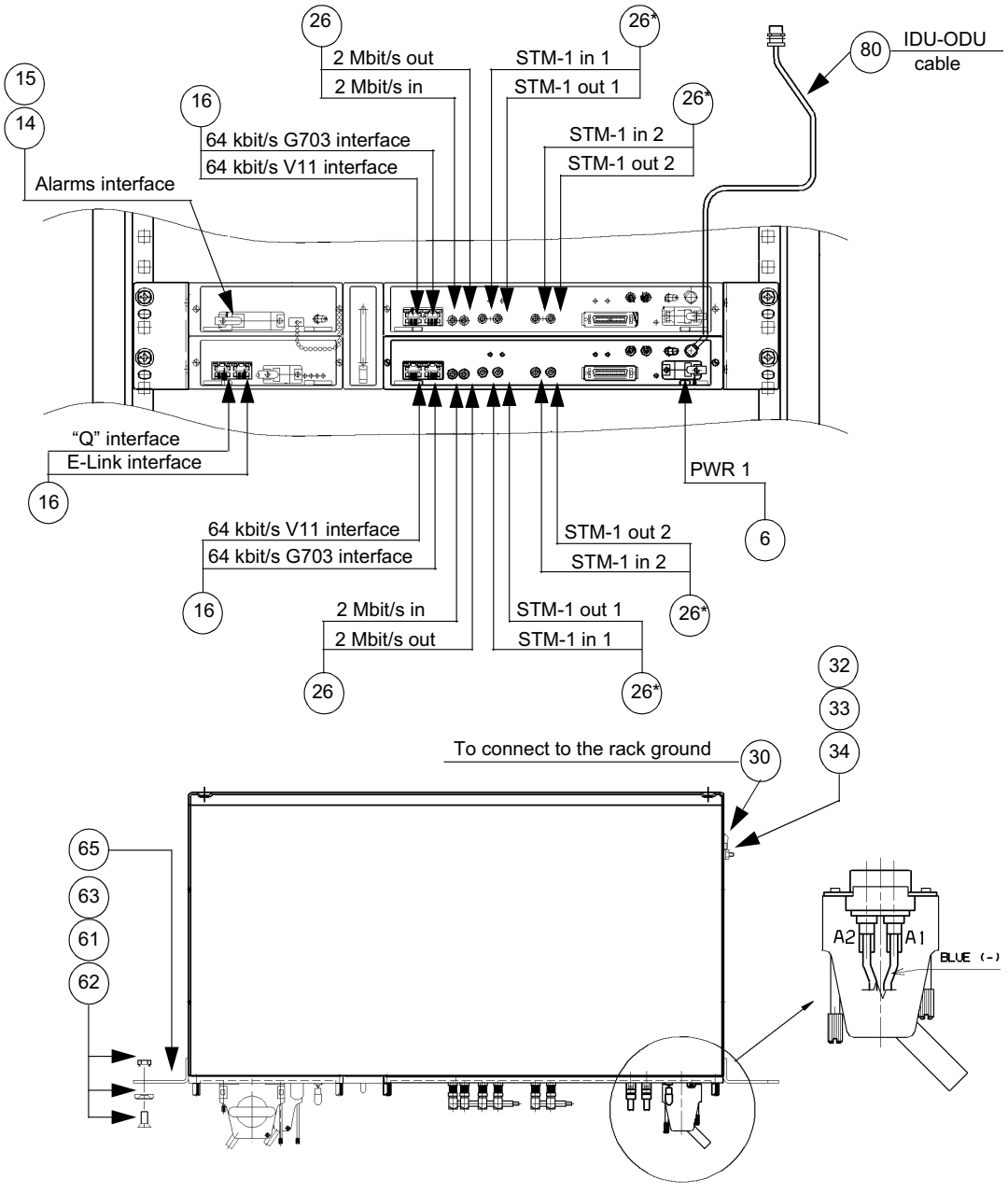
| Ref. Fig. 3.45 | P/N | Description | Q.ty |
|---|---|---|---|
| 6 | 332-308/64 | Power supply kit | 1 |
| 16 | 422-053/63 | Modular plug 8P shielded | 2 |
| 26 | 421-015/70 | 1.0/2.3 coaxial plug | 6 |
| 80 | 314-327/91 | (N-OSM) coaxial cable | 1 |

**Fig. 3.43 Connection kit for 1+0 system**



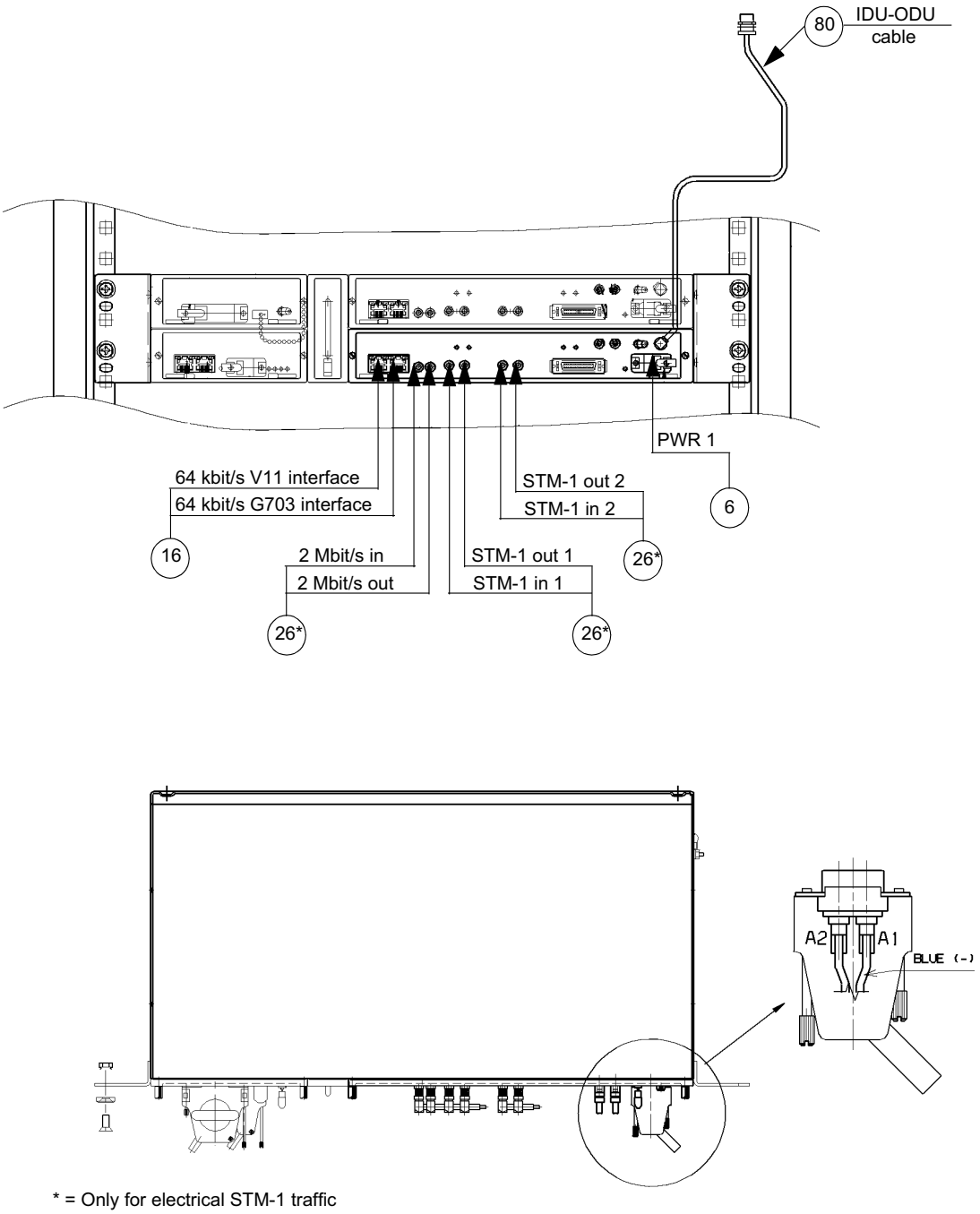

* = Only for electrical STM-1 traffic

**Fig. 3.44 Connection kit for 1+1/2+0 system**




* = Only for electrical STM-1 traffic

**Fig. 3.45 Connection kit for 1+0 to 1+1/2+0 upgrading**




* = Only for electrical STM-1 traffic